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REPORT

SUBJECT

Report on the Metropolitan Region of
Warsaw by K. Lier and L. Zawadzki,
Department of Space Economy and Regional
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a 34-page report in English entitled
"The Metropolitan Region of Warsaw" by Kazimierz Lier and Lech Zawadzki
of the Department of Space Economy and Regional Planning, Institute
of Geography, Polish Academy of Sciences, Warsaw, 1963. It gives
considerable information on demography, the economy, trade, communications,
employment structure, housing, and regional planning. [OFFICIAL USE ONLY]

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POLISH ACADEMY OF SCIENCES
INSTITUTE OF GEOGRAPHY
Department of Space Economy and Regional Planning

THE METROPOLITAN REGION OF WARSAW

Prepared by Kazimierz Lier
with the collaboration of Lech Zawadzki

Warsaw 1963

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THE METROPOLITAN REGION OF WARSAW

Warsaw is the capital of Poland.

Many geographical, historical, demographic and political factors exerted their influence on the formation of the role of Warsaw in the social and economic life of the country /1/.

Geographical location

The middle part of Poland is intersected by a system of diluvial valleys /Urstromtäler/, stretching from the extreme East of the country to western Europe where they join with the valleys of the rivers of Germany and France.

Warsaw is situated in the place where the central course of the Vistula intersects one of these Urstromtaler - the Warsaw-Berlin one. The plain which is intersected by this valley lying between a barrier of high mountains on the South and a stretch of seas on the North is a natural channel gathering the east-west continental communication routes. At the same time, the Vistula valley lies on the line of the shortest connection of the Baltic Sea Basin and that of the Black and Adriatic Seas. The direction along which the Vistula flows coincides with a convenient communication route traversing the continent from the North to the South /2/.

Warsaw lies in the spot where the terraces of both banks of the Vistula, approaching one another, narrow the river valley and form favourable conditions for crossing it /3,4/.

Warsaw, therefore, is particularly privileged in its situation, being on the intersection of belts gathering two principal European transit routes. Owing to its situation Warsaw plays a role of an important traffic junction and has conditions which are favourable for the foundation and expansion of a city.

The history of the origin and expansion of Warsaw

Warsaw lies on the area of Mazovia which at first was one of the provinces of the early Polish State. The lands on which Warsaw arose are settlement terrains with a tradition reaching the 13th century /5/. In the early Middle Ages, fortress towns and defensive castles were established in the Vistula valley.

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An example of this period are the ruins of a castle of the Mazovian princes in Czersk, situated on the Vistula about 25 km to the south of Warsaw /6/.

The original settlements appeared on the terrain of future Warsaw during the early Middle Ages. A fortress town was built in the 11th century near the intersection of the waterway with the land roads in Jazdów /Ujazdów/ - one of the centers of the Duchy of Mazovia and which was the seat of the prince. Settlements which were markets in character, arose near the town, there being means of crossing and trans-shipment center. As the geographical conditions were favourable the settlements expanded at a rapid rate as the economic life of Mazovia became brisker. Together with the advancing concentration of commerce, craftsmen were attracted to the town and the number of population increased. In the settlements, the original inhabitants of which serviced the river crossings and were occupied in fishing, functions began to develop which were typical for mediaeval towns.

One of these settlements, Warsaw, acquired, at the end of the 13th century, a charter and city rights. The physical expansion of the town took place in accordance with the pattern of the times.

The foundation of the building of the town is a checker-board arrangement of blocks and streets with a rectangular market place in the center /7/. The town is surrounded by defensive walls /8,9/. The castle situated outside of the walls belongs to the defensive system.

The Gothic arrangement of old Warsaw, retained to the present day, was for many centuries the nucleus of its territorial expansion. New districts arose in the forelands of the old town, mainly along the roads leading to it /10,11/. Among such, the southern route connecting Warsaw with the castle in Jazdów /the present streets: Krakowskie Przedmieście, Nowy Świat, Aleje Ujazdowskie/ became the axis of the greatest concentration of buildings /12,13/.

In the middle of the 14th century Warsaw became the capital of the Duchy of Mazovia.

The Union of Poland and Lithuania followed in the 16th century. The area of the state was, thus, extended toward the

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East and Warsaw found itself in a central position on it. Warsaw became the seat of a number of the highest state institutions. The united Diets of both countries: Poland and Lithuania as well as the electoral assemblies were held here. Toward the end of the 16th century, the kings moved their permanent seat from Cracow to Warsaw.

Henceforth Warsaw was the capital of Poland. Being a capital is the principal feature of Warsaw, it set the course for development and lasted even through the time when freedom was lost and when Poland was partitioned. From 1815 up to 1915 Warsaw was the capital of the Kingdom of Poland, set apart from the lands annexed by the Russian empire /14/.

Warsaw played officially no political role during this hundred-year period but it was the center of thought and activities upkeeping the will of the people to regain independence. Warsaw took the leading part in the successive attempts to win freedom by armed force in the uprisings of 1830 and 1863.

The political role of Warsaw became limited during the violent industrialization of Europe and was concurrent with the development of industry and commerce. The expansion of the population of Warsaw was not checked.

During World War II, Warsaw fought against the brutal force of the Nazi occupant. A tragic beginning of these combats was the insurrection in the ghetto. An action was begun by the Nazis in 1942 of a systematic murder of the Jewish population enclosed within the walls of the ghetto formed by the Germans. In 1943, the Jewish population began a hopeless defensive battle ending in defeat. About 360 thousand Jews lost their lives in the Warsaw ghetto /15/.

The last act of the war with the Germans was the Warsaw insurrection in 1944. The insurrection collapsed after two months of fighting. About 20 thousand insurgents and 150 thousand civilian population lost their lives in the struggle. The German army lost about 20 thousands, killed and lost.

The Second World War brought Warsaw almost complete devastation. The destruction of the city began in 1939 when the capital was being conquered by the Germans, reached its peak in 1944 and 1945 during the insurrection and in consequence of a planned de-

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molition made by the retreating occupant. After the ghetto was eliminated, the compactly built-up area of about 180 hectares was razed to the ground.

Immediately after the war, the number of the population, which before the war amounted to 1,300 thousand inhabitants, fell to about 160 thousand, that is about 12% of what it had been before the war. Eleven thousand apartment buildings were destroyed, that is 72% of the entire number. The total destruction caused in industry was estimated at 90%. Technical and communal equipment was destroyed in similar proportions /16/.

In spite of such a catastrophic ruin, Warsaw was rebuilt as the capital of the Polish People's Republic by the will of the people followed by the decision of the government.

Today, in 1963, in consequence of an immense outlay of labor and financial means, Warsaw has been almost entirely rebuilt /17,18,19,20,21/. The number of its inhabitants approaches that of before the war and amounts to 1170 thousand persons.

Warsaw attained the following numbers of inhabitants in the individual stages of its development:

Year	No of inhabitants in thous.	Year	No of inhabitants in thous.
1564	14	1897	600
1655	18	1915	780
1786	96	1939	1300
1819	100	1944	162
1839	140	1950	815
1870	270	1961	1140

Warsaw is one of 29 European cities with a population of over a million and is listed as the twelfth in order in this category.

The role of Warsaw in Poland

Demographic conditions

Warsaw is the largest city of Poland. The number of the population is over one and a half times greater than that of the population of the next largest city - Łódź.

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In 1960 the population of Warsaw was:

- 3.9% of the population of the country
- 8.1% of the population of the cities
- 18.7% of the population of cities with over 100 thousand inhabitants
- 27.1% of the population of cities with over 200 thousand inhabitants.

During 1931-1960, the percentage defining the ratio of the number of population of Warsaw to the total number of the population of cities became lower. In 1931, it was 13.4% whereas in 1960 - 8.1%. This was caused, on one hand, by the fact that the continuity of the growth of Warsaw was interrupted in consequence of war ravages, and on the other - by the urbanization of the country after the war.

During 1950-1960, Warsaw evened out the loss in population. The population in the country increased 18.9% in this period - the population of Warsaw increased 40%. A marked part of the population of Warsaw came from immigration. In the number of 320,500 persons, by which the population of Warsaw increased during 1951-1960, the birth rate amounted to 143,000 persons, the immigration increment to 152,500 and 25,000 persons were added in consequence of the extension of the boundaries of the city. Because of the large part immigration occupies in the population increment of Warsaw, there is a large difference in the age structure of the population of the capital in comparison with the population of the country. There are fewer young people /up to 15 years of age/ in Warsaw. This group comprises 27.5% whereas it comprises 35% in the country. On the other hand, the group of the population of working age is greater: in Warsaw 62%, in the country - 55%. The group of the population which is already above working age is also larger: in Warsaw - 11%, in the country - 10%.

In addition to the migration movement, the birth rate took a large share in the restitution of the population of Warsaw. When compared with conditions typical for large cities, it was very high. The birth rate, as a resultant of births and deaths ran in successive periods /per 1000 inhabitants/ as follows:

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The Birth Rate in Poland and Warsaw

Year	W a r s a w			P o l a n d		
	Births	Deaths	Net increase	Births	Deaths	Net increase
1937	14.0	4.4	2.6	25.8	14.3	11.5
1950	21.8	9.3	12.5	30.7	11.6	19.1
1953	23.5	8.0	15.5	29.7	10.2	19.5
1956	21.9	7.2	14.7	28.1	9.0	19.1
1958	18.9	7.1	11.8	26.3	8.4	17.9
1960	13.9	6.7	7.2	22.4	8.0	16.6

In the period when the results of the destruction and depopulation of the city were directly felt, the population renewed by the immigration showed a tendency to a rapid compensation of the biological losses. As the results of the war began to vanish and the immigration began to diminish, the birth rate violently dropped.

The drop in the death rate was also of very great significance in the way net increase took form, for which one must give due regard to the fact that the health service became more efficient and prosperity increased. The death rate of infants notably dropped in comparison with the period before the war.

Infant Deaths per 1000 live births

1933-1937	105.3
1958	36.0
1960	28.4

Center of work

Warsaw, rebuilt, maintaining its role as capital of Poland, is at the same time an intensive center of productive work.

The role of Warsaw plays in the economy of the country is its large share in the creation of national income. In 1958, such share amounted to a total of 6.3% distributed as follows:

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industry and craftsmanship	8.2%
building	11.0%
transportation and communication	8.3%
economic turnover	10.2%
remaining kinds of production	8.3%

The amount of the national income per one inhabitant amounted to:

on the average in the country 11,800 zł.
in Warsaw 19,800 zł.

The kind of work done in Warsaw is shown in the numerical ratios of those employed in individual branches of the economy, compared with data of the country.

From among the total of persons employed in the country, the following worked in Warsaw:

in industry and crafts	5.6%
in building	11.6%
in transportation and communication	7.2%
in commodity turnover	9.5%
in communal and housing development	16.3%
in education, learning and culture	14.1%
in health service and social welfare	10.3%
in administration and administration of justice	18.1%

The most important branches of production were the industries: wearing apparel, leather-footwear, food, polygraphic and the building material and textile industries. The most intensively expanded branch was that of the metal and machinery industries. The production cross section thus formed is maintained until the present day, the predominant role continuing to be played by the metal industry, recently enlarged by the production of electrotechnical and electronic commodities. The expansion of the industry became especially intensive after 1945. Destruction caused by the war, constituting 90% of the 1939 status was rebuilt. The dynamics of the expansion of the Warsaw industry in the last 15 years is illustrated by comparing the numbers of persons employed, which in 1939 amounted to about 90,000 persons, in 1960 grew to over 160 thousand persons. As productive plants were expanded and convenient terrains in the city were exhausted, industry began to expand on suburban areas.

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Service center

Against a background of a comparison of conditions in the country and Warsaw, an outstanding role is played by the capital as an administrative and service center. Warsaw is the leading center rendering service for the country.

Of the total number of the 75 university schools, 14 are in Warsaw. The number of graduates from the Warsaw university schools amounts to about 1/5 of those graduating in the entire country. The number of such persons in 1960 amounted to about 21,000 of which 4,300 persons received their diplomas in Warsaw. There are 4450 /26%/ educators from among the 17,350 employed in the entire country, working in schools of higher learning in Warsaw.

Warsaw is the greatest center of learning and cultural services in the country.

There are almost 9000 thousand volumes collected in the Warsaw libraries, that means about 10% of the volumes constituting the entire fund of libraries in the country. In special research libraries, 1/3 of the total volumes found in libraries of this type in the country are collected in Warsaw.

Warsaw is a large publishing center. Of the total sum of published items, amounting to 7305 in the country, there were 4720 published in Warsaw, that is 65%.

About 25% daily and weekly newspapers appear in Warsaw, and almost 50% of the monthlies.

Warsaw occupies the leading place in the theatrical and musical life. In Warsaw there are 21 theatres and musical institutions of the 125 of the entire country. The 12,600 seats in theatres and concert halls constitute 22% of the seats of all institutions of this kind in the country.

Of the 46,235 plays and concerts given in the country in 1960, 6600 or 14% are given in Warsaw.

Warsaw is a museum center. In 1960 the number of museum exhibitions in the country amounted to 185, in Warsaw - 22. Of the total number of 7975 persons visiting museums, 2544 persons visited the Warsaw museums.

Of the 20 broadcasting stations in Poland, there are 4 in Warsaw and one central television broadcasting station of

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the total number of 7. The share taken by the radio broadcasting stations of the capital in the total number of school broadcasts receiving the Warsaw program, measured in broadcasting hours amounts to over 60% of the time broadcasted in all the broadcasts of the country. Similarly, the program of the Warsaw television is retransmitted to about 70% of the remaining stations in the country.

The organization of the health service, after the immense war loss incurred, is not fully satisfactory. The state, however, continues to improve. The number of hospitals, which in 1950 amounted to 16, grew in 1960 to 35, and the number of beds correspondingly grew from 5640 to 9700. In spite of the fact that the attainment of a norm of 85 beds per 10,000 inhabitants is not sufficient, Warsaw makes its medical services available to the country. The importance of Warsaw in this respect lies in the expansion of specialized therapeutics. In the total number of hospital beds, the number of beds in specialized hospitals in Warsaw amounts to 25% whereas to the rest of the country - 12%. There are 35.8 /22 of these are specialists/ doctors per 10,000 inhabitants working in the capital. For the same number of population in the entire country there are 8.9 doctors on the average /of these 4.5 are specialists/.

Trade center

Warsaw trade renders services within a certain range in addition to the population of the city also to the inhabitants of the entire country, primarily to the inhabitants of the region.

In 1960, the values of goods sold /in socialized trade/ amounted to 205.9 million zlotys in the entire country of which in Warsaw - 17.2 mil. zlotys, that means 8.4% of the value of the goods sold in the country.

In calculating per 1 inhabitant, the value of goods sold in Warsaw was twice as high as the average in the country and about 20% higher than the average of other large cities.

Traffic junction

By its geographical situation and relations created during its growth, Warsaw became an important traffic junction /22/.

The present existing communication system arose by several

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coincident directional systems consisting of:

- the road system of a continental and international significance, involving the direction of parallel latitudes connecting east and west and the meridional direction which connects the basins of the Baltic Sea and the Black Sea and Adriatic Sea;
- the system of centripetal roads of a national significance, connecting the various areas of the country with the capital;
- system of local roads, connecting Warsaw with centers lying within the zone of its direct influence;
- the system of the internal city communication as connected with the external communication.

Corresponding to transportation tasks, the individual directions are equipped in single or jointly operating transportation means composed of normal and narrow-gauge railways, highways, aerial transportation and finally waterways.

In 1960, 1,197,700 passenger trains of which 11,800 were express trains, came to the Warsaw railway stations along normal gauged railway lines. That year, 20,450 thousand passengers having one-way fares began their trip from Warsaw. Furthermore, part of the service of the daily suburban traffic, encompassing going to and from work and school, falls to the normal-gauged railway lines. There are on the average about 175,000 such trips daily.

A supplementary role in the suburban communication is filled by 4 local lines and autobus transportation. Local trains bring in about 20,000 passengers during the day, autobuses about 13 000.

Bus transportation also services long-distance traffic. There were 46 long-distance bus lines in service in 1960. About 3035 thousand passengers began their trips from Warsaw by bus on a one-way fare.

The main role filled by railways is freight transportation. The railway brings the commodity mass destined for the production and consumption supply of the capital, and at the same time distributes the products coming from industrial plants of Warsaw.

The incoming cargo mass noticeably exceeds the outgoing cargo mass. This is caused by the immense demand of a large

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concentration of the population and of industry working without a local raw material base and by the building industry utilizing the materials carried in.

In 1960 by normal-gauged railroads a total of 7828 thousand tons was brought to Warsaw a total of 617 thousand tons was carried out of Warsaw. Calculating per 1 inhabitant, the railway transports 6.8 ton products yearly into the city.

Since the rivers are not improved, the inland water transportation is till now rather less developed. Water dams will be built on the rivers within the region of Warsaw. Thereby the rivers will become navigable, and also the supplementary electric power will be obtained.

Some of the rivers flowing across the area near Warsaw will be included into the West-East European arterial water road.

As first stage of this project the dam on the Narew river near Debe has just been finished /23,24/.

The Warsaw aerodrome is the central point in the national aerial communication and one of the important junctions in European communication, playing an increasingly greater role in international connections.

In 1960 there were 7 lines operating in connections within the country, of a joint length of 1800 km. There were 5400 flights made on these lines, transporting about 103 thousand passengers.

There were 3075 flights and over 52 thousand passengers transported on the 14 international routes of a joint length of 13 500 km serviced by the Polish Air Lines. Furthermore, Warsaw operates for 10 foreign lines. In the connections with the capitals of 8 European countries, these transported in 1960 45 thousand passengers from and to Warsaw, without transit.

The Warsaw Region

The formation of agglomeration

The weight and increasing range of tasks, which fall to the capital center in social, political and economic life, effects a constant growth of the concentration of population, and places of work both in production and in services.

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At the turn of the 19th and 20th centuries, the expansion of Warsaw had reached a stage where the physical organization of concentration went outside of forms of the previous conception of a city. The influence of Warsaw was extended to the terrains surrounding it and within its limits factors of economic management supplementing the functions of a central urban center gradually arose.

Thus the process of the formation of agglomeration began. Even at the end of the 19th century /1897/ when Warsaw had about 600 000 inhabitants, the physical development connected with the life of the city was contained within the administrative limits of that time and did not go out of the area of compact building typical in cities. The number of places of work was more or less respective to the dwellings on this area. There was no coming to work from the suburbs. The nearest, and that not very large, town centers, filled the role of service centers for the agricultural hinterland - lying at a distance of over 30 km from Warsaw /25/.

At the turn of the 19th and 20th centuries, owing to the steady expansion of the industrial function, a lack of convenient terrains arose for sites for productive plants within the area of the compact urban building. The factories were established in the suburban zones. At the same time, the increased capacity of the labor market effected an inflow of population. The population settled not only in Warsaw but also in its environs. A numbers of towns and settlements the expansion of which they owed to the influence of Warsaw arose in the suburban zone.

In the middle of the 20th century /1955/, the suburban zone was urbanized to a marked degree. Over a half million persons lived within its boundaries. The greatest concentration of the population and industry was found on the terrains lying within the sphere of the influence of the oldest railway line /the Viennese line/ toward the west /26/.

A decisive role in the urbanization of the suburban zone was played by the expansion of the Warsaw industrial center.

Warsaw industry began to expand in the twenties of the past century. In view of the absence of raw materials /with the exception of raw materials for the building industry/, the

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Warsaw industry was dependent on supplies being transported. Its actual expansion followed the opening of the first railway line /1847/ connecting Warsaw with the Upper Silesian Coal Basin. The trend of production took shape under the influence of the needs bound with furnishing supplies to a large concentration of the population, with propitious conditions for sale of products on the markets of the Russian Empire and with the possibility of utilizing highly qualified workers.

An illustration of the rate and trends of industrial expansion in Warsaw and in the suburban zone are the employment relations observed in consecutive stages: at the beginning and in the middle of the past century /1827, 1862, 1880/, at the threshold of the 20th century /1910/, before II World War /1937/ and in recent years /1957/ /27, 28, 29, 30, 31, 32/.

At first, the food industry predominated in the suburban zone which processed agricultural and breeding raw surplus products. After the railway junction and the electric power network were expanded other industrial branches were also located in the suburban zone which cooperated with the industry of Warsaw and supplemented its production.

In consequence of the urbanization of the suburban zone, a dense network of towns and settlements arose. The distribution of urban centers in the vicinity of Warsaw is much more intense than on the distant areas lying in the remaining parts of the Province of Warsaw.

The character of the settlements and the degree to which they are dependent on the central capital center is expressed in the employment proportions in industry and services outside of the locality and the numbers of persons coming to Warsaw to work. Employment in industry and going to work is much greater in the suburban zones than it is in more distant places. Service functions which are more than local in importance, are poorly represented in suburban towns and settlements. These towns and their gravity regions lie in the zones which are directly under the influence of the service centers of Warsaw where their inhabitants meet their needs /33/.

The links binding Warsaw with the terrains encircling it define the rate of the passenger traffic to the city. The intensity of such traffic definitely increases at stations

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which are 20-30 km distant. The phenomenon is confirmed by observation of the traffic during the day. The peak traffic hours coincide with the time work begins and ends. About 70% of the persons conveyed daily takes place at the peak traffic hours /34/.

Characteristics of agglomeration

In circumstances when the administrative boundary of Warsaw ceased to be a line along which the expansion of urban concentration stopped, it became necessary to undertake research on the Warsaw region and to make a hypothesis as to its expansion, which would form the foundation for the formation of a physical organization.

Work on the regional plan of Warsaw was begun in 1930 and in various organizational forms and in a more or less intensive way has been conducted until the present.

An area delineated approximately within a radius of 50 km was taken for the study of the regional plan. The differing intensity of the influence of the city on this area is defined sufficiently clearly in order to adapt a criterion which would define its actual range.

The region is composed of: the city of Warsaw and the districts: Nowy Dwór, Wołomin, Pruszków, Otwock, Piaseczno, Minsk, Wyszaków, Grójec, Garwolin, Sochaczew and Grodzisk. Within the area defined as a region it would be possible /1/ to solve a correct physical structure of the agglomeration of the capital, /2/ to pose a conception for the development of the terrains within a range necessary to find the means of connecting them with neighbouring centers, /3/ to form a traffic junction, /4/ to arrange an agricultural hinterland, and /5/ to organize a relaxation center for the holidays.

The research made led to distinguishing several zones in the region /35/:

- the central zone is part of the area encompassed by the administrative boundaries of the city, with a typically urban development, intensively built up, with limited green surfaces and inhabited by the population working in professions other than agriculture. The surface area of the central zone amounts to 175 sq km. The zone is inhabited by 1 million

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persons. The density of the population is 5700 inhabitants per 1 sq km.

- the suburban zone encircling the central zone, is together with it the regional area for the expansion of the actual agglomeration. This zone lying approximately within a range of a 45-minute isochrone of the travel to the center of the city has a surface area of about 2250 sq km with an average population density from 100 to 200 inhabitants per 1 sq km.
- the outer zone is the area surrounding the suburban zone. The fundamental development of and employment in this zone is agriculture. The surface area amounts to about 7500 sq km, the average density of the population is 30-100 inhabitants per 1 sq km.

Each of the zones is featured by a different economic structure. The differentiation of the structure finds its expression in the relations of employment corresponding to the work done. In the division into sections of the national economy, there are employed /in percentage of the total employment/

	in agri- culture and forestry	in indus- try and crafts	in trans- portation and commu- nications	in services of all types	total
Central zone	3	45	9	43	100
Suburban zone	57	26	3	14	100
Outer zone	78	12	2	8	100

The processes confirming the proportionality of the formation of its development under the influence exerted by the capital center show in the suburban zone particularly high dynamics.

The suburban zone is the actual developmental area of the capital and together with the central zone constitutes the area of the Warsaw agglomeration.

In addition to the three principal zones, two areas of a special character are distinguished on the terrain of the region. These are the Otwock region and the forest complex of the Kampinos Forest.

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The Otwock region lies on an area lying on a layer of several meters of permeable sands - amidst coniferous forests. The climate conditions of this region are especially favourable for treating lung diseases. Otwock is a climatic-sanatorial station, serving not only the inhabitants of Warsaw but also the ill of other parts of the country.

One of the rare singularities occurring in the direct vicinity of large cities is the Kampinos Forest, a complex of forests of a surface area of 20 thousand hectares. The western edge of the Kampinos Forest is adjacent to the boundaries of Warsaw. A preponderant part of the woods of the Forest grows on a picturesquely formed dune terrace. The Forest is a rare and valued object of nature. In 1959, the Forest was acknowledged as a National Park. It is being gradually developed in order to make it accessible for relaxation and tourists /36, 37, 38, 39/.

An analysis of phenomena characterizing the influence of Warsaw and the changes which these phenomena were subject to during the 1950-1960 period served to define the range of the agglomeration.

The following were subjected to the analysis:

- the size and places from which people travelled to work in Warsaw,
- the density of the population in cities, settlements and rural terrains,
- proportions of employed expressed in percentages of the population maintaining themselves from professions other than agriculture,
- the number of rooms per surface unit.

Observation of the phenomena mentioned during the ten years examined shows the following features:

- the density of the population has grown very rapidly on the areas of the suburban zone and this growth is even greater than that on the peripheral terrains of Warsaw. In individual suburban centers, the density of the population grew: 25% in Grodzisk, 32% in Pruszków, 125% in Otwock, 90% in Legionowo, 53% in Nowy Dwór, 65% in Wołomin, 70% in Sulejówek /40, 41/.
- A large percentage of the population maintaining themselves from professions outside of agriculture /exceeding 80%/ are

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- not only on the city areas, but also in a wide range and to an increasing degree on suburban terrains /42, 43/.
- Building in many suburban places /Pruszków, Piastów, Milanówek, Grodzisk, Brwinów, Nowy Dwór, Wołomin/, measured by the number of rooms per unit surface, reaches a density which is typical for the predominant part of the Warsaw area /400 to 2500 rooms per 1 sq km/. A greater density of building development is only encountered in the central districts of the capital /44/.
 - The area from which comes 70% of the total persons going to work to Warsaw coincides with the area on which other phenomena appear testifying to a high degree of urbanization /45/.

A synthetic compilation for individual territorial units of the areas of indices characterizing the simultaneous occurrence of the phenomena studied in an equal intensity or exceeding a certain critical size, makes it possible to define the boundaries of a particularly strong and direct influence exerted by Warsaw. The area encompassed within these boundaries defines the range of the Warsaw agglomeration /46, 47/.

In 1960, the population of agglomeration amounted to 1,627 thousand persons. Of this number 1136 thousand persons lived in Warsaw and 491 thousand in the suburban zone.

The changes in the numbers of the population on the agglomeration area compiled for the 1921-1960 period confirm the rapidity with which agglomeration is formed.

	1921	1931	1946	1950	1955	1960
	/in thousands of persons/					
Population in Warsaw	972	1277	604	836	1080	1136
Population of the suburban zone	206	323	295	345	419	491
<u>Indices of growth</u>						
Population of Warsaw	100	131	62	86	106	116
Population of the suburban zone	100	153	113	157	202	238

Neglecting the disturbances in the continuity of demographic expansion caused by the war, one may assert that the dynamics of the population increase is greater in the suburban

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zone than it is in Warsaw.

Warsaw became a notable labor market after the war and after socialist economy was introduced.

The kind of work done in Warsaw and its evolution is illustrated in the proportions in employment according to the sections of the national economy and in the comparison of the changes in employment structure of 1931, 1950, 1960.

Employment Structure in Warsaw
1931-1960

Section of the economy	Employment in percentage		
	1931	1950	1960
Industry and crafts	37.6	21.2	30.7
Agriculture and forestry	0.8	2.2	2.5
Building	5.1	16.1	14.8
Transportation and communication	8.9	5.2	8.5
Commerce	15.1	11.5	11.7
Communal and housing management services	5.5	5.6	5.3
Learning, education and culture	3.7	7.0	10.4
Health and social welfare	1.9	2.6	5.2
Administration, finances and administration of justice	7.6	17.5	7.9
Remainder	13.8	10.6	3.0

An absolute increase in employment took place in 1951-1960 from 406 000 to 620 800 persons.

Employment in individual sections of the economy amounted to:

	1951	1960	Index 1951=100
Industry and crafts	83.8	191.2	227
Agriculture and forestry	11.6	15.1	130
Building	79.6	91.6	115
Transportation and communication	33.9	52.6	155
Commerce	56.6	72.8	128
Communal and housing management	16.0	33.0	206
Cultural and social services	43.9	96.6	220
Administration, finance and administration of justice	69.1	48.5	70
Remainder	11.6	18.7	160
T o t a l	406.1	620.1	153

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Great changes occurred in the employment structure over a period of ten years. In consequence of the elimination of excrescences and a certain decentralization, there was above all a marked decrease in employment in administration. Employment in industry together with its reconstruction and expansion increased very greatly. The part taken, however, of industrial workers in the total employment structure was smaller than in 1931. This resulted from an increased work output and from the fact that large plants took over the duties formerly carried out by small craftsmen's shops.

Employment in building in proportion to increased tasks was only insignificantly larger. Tasks, which were about 180% greater, were fulfilled by increasing work output which in turn was achieved by mechanization and the use of industrial methods.

There was a noticeable increase in employment in economic and social services. This was connected with a simultaneous expansion of the trade and service network, a high development of culture and health service, and an increased activity in housing and communal management. The increased employment in agriculture is connected with the extension of the boundaries of the city, which took over sizeable areas left under cultivation.

The remaining agglomeration supplements the work of institutions and plants situated in Warsaw and cooperates with them. Cooperation assumes various forms. One of such is to supplement the working crews of Warsaw by inhabitants of the suburban zone. The daily pendulous movement to work in the capital is expressed by the number of about 113 thousand persons traveling into the city, which means that there is at least one person coming from the suburban zone for every five persons employed in Warsaw.

Another form of co-operation is that the trends of industrial production in plants in the suburban zone are set to co-operation with the industry of Warsaw, in view of which it plays a complementary role.

Furthermore the industry of the suburban zone expands an industry which is connected with meeting the requirements of a large concentration of population in the capital.

Another form of the interdependence of the industry of the

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central zone and the industry of the suburban zone is to make it possible for the latter to undertake such kinds of production which would require management and control based on co-operation with scientific and research centers. Proximity to a scientific center in the capital makes such co-operation possible.

Taking into account the close ties existing between the work of Warsaw plants and plants of the suburban zone, one can assert that jointly they constitute one interacting concentration of industrial production, the elements of which are separated by a random administrative boundary.

The large share that the suburban zone takes in the work of the concentrated industry is accentuated by the structure of employment in five districts, the surface area of which approximately coincides with the agglomeration area.

The Structure of Employment of Nonagricultural Population
in 5 Districts of the Suburban Zone in 1960

Branch of economy	D i s t r i c t s						
	Nowy Dwór	Prusz- ków	Pruszków town	Pia- seczno	Otwock	Otwock town	Woło- min
Industry and crafts	42.8	62.9	63.0	52.0	30.1	13.1	47.5
Building	5.5	10.5	5.4	5.7	13.6	9.2	9.5
Transportation and communica- tion	6.2	3.4	4.4	8.0	11.8	4.5	7.5
Commerce	19.6	7.1	8.3	12.0	12.3	8.9	13.7
Communal and housing services	-	0.8	1.0	0.8	-	3.1	0.8
Social and cul- tural services	13.6	10.4	14.5	16.2	24.2	51.0	13.5
Administration, finances, admini- stration of justice	7.5	0.7	2.3	4.6	8.0	4.8	2.7
Remainder	4.8	4.2	1.1	0.7	-	5.4	4.8
T o t a l	100.0	100.0	100.0	100.0	100.0	100.0	100.0

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The low numbers in the group connected with the work in the services draws attention to the structure of employment for the suburban zone. The phenomenon is explained by the fact that the inhabitants of the suburban zone meet their needs, especially with regard to services of a higher order, in institutions working on the terrains of Warsaw.

The large share of employment in industry is explained by the fact that the group embraces not only those employed on the spot, but also those coming to Warsaw to work.

The two parts of the Warsaw agglomeration, divided by an administrative boundary should constitute a uniform social, economic and physical organism. A full integration is made difficult by the differentiation made in the economic and material values, occurring in the level of the development of the city and terrains encircling it.

Such differences involve above all the values of building of dwellings and the degree to which the terrains are equipped in communal facilities.

As a result of war damages and the rapid process of rebuilding, the share taken in the total stock of dwellings in Warsaw by dwellings in new buildings is becoming larger. In 1958, with a total number of 588.6 thousand rooms, the number of rooms in new buildings amounted to 36%, whereas in 1960, with a total number of 707.4 thousand rooms, the proportion rose to 55%. The value of apartment buildings is high inasmuch as the predominating part of them is of buildings newly constructed. It does not only depend on the low degree of wear of the buildings. Most of the buildings, erected from social funds, are equipped in the basic technical installations.

On the other hand, so far as the suburban zones are concerned, the share of socialized management in creating the flats is small. Many of the buildings, especially those which have gone up as uncontrolled building, is substandard in character. Building, retained from the times of the liberal capitalist economic management and resulted from private initiative is differentiated with regard to the type of building and often chaotic.

The state of dwellings in Warsaw amounted in 1960 to:
 308 000 flats to the total number of 707 400 in 47 800 buildings,
 The total cubature of the buildings - 71 750 000 cu m.
 Utility surfaces of the flats - 13 000 000 sq m.

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	Number of buildings	Cubature of buildings
T o t a l	100%	100%
City property	18%	56%
Property of state institu- tions	4%	10%
Property of co-operatives	3%	7%
Private ownership	75%	27%

Of the total number, flats are equipped:

in a bathroom	51%
in a toilet	64%
in central heating	42%
in electric power	98%
in gas	53%

In spite of the rapid increase in the number of inhabitants of Warsaw after the war and what is connected with it - the immense tasks in the reconstruction of dwellings, the housing conditions, even though they are as yet unsatisfactory, are continually improving.

During the 1939-1960 period, there were on the average per one room:

<u>1939</u>	<u>1947</u>	<u>1950</u>	<u>1960</u>	inhabitants
2.1	2.2	1.9	1.6	

The housing conditions of the suburban zone are much less favourable. The number of flats in towns and settlements of an urban type of five districts, the area of which was approximately equal to the surface area of the suburban zone were expressed in the following numbers /1960/

88 850 flats
193 000 rooms.

Although the average density /1.68 persons per room/ is more or less the same as in Warsaw, the value of the majority of the flats is much lower. On the whole, both the construction of the buildings as well as their equipment is much more primitive.

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Only some of the towns and settlements have the beginnings of sanitary installations, the range of which embrace but fragments of their areas.

Of 28 towns and settlements, only 11 are partly furnished with a water supply system - and 15 with a sewage system.

From a total number of 37 500 buildings, 2.4% are connected to a water supply system and 2.1% to a sewage system. Conditions should improve in this respect within the next years because many towns are intensively working in installing a water supply and sewage system.

Assumptions for the development of the Warsaw agglomeration

The assumption for an anticipated expansion of the capital complex were two premises, one of which is static in character and the other dynamic.

The characteristics of the terrain constitute the static premise: its expanse, the natural and geographical conditions and the present state of development. The dynamic premise is the hypothesis for the formation of demographic conditions on which depends the amount of work that can be done on the given area and which defines the requirements for organizing the right number of places of employment and the conditions for developing the terrain as an environment for the population inhabiting it.

Prospects for the year 2000 were taken into account in the demographic hypothesis. The period anticipated thus encompasses approximately 40 years which corresponds to a period of work for one generation.

The hypothesis of a population growth was based on an anticipated general situation in the country.

Taking into account the anticipated increase in population and changes in the proportions between the population of cities and the countryside, it was estimated that the number of population of Warsaw, not understood as an administrative unit but as a capital complex would probably increase by the year 2000 to 3.5 or 4 millions.

The physical structure

The nucleus of a physical system of agglomeration obviously is the area of the city proper, an area compactly built up in an urban way and constituting a complex of central districts.

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The structure of a city is to a marked degree decisive of the conditions under which the remaining parts of agglomeration are formed.

About 80% of the total cubature of buildings constituting the buildings of Warsaw comes from those erected after 1945. The part taken by new buildings is the result of work connected with the reconstruction of buildings destroyed during the war. Warsaw in a certain sense is a city built up from its foundations. Thus possibilities arose of adapting its structure to new tasks and circumstances created by the building up of the socialistic system.

In spite of the great changes which had taken place in the structure of a reconstructed city, its principal framework issuing from the natural and geographic features of the terrain and which had been fixed in its historical development was preserved.

The basic element forming the physical system of Warsaw is the Vistula and what is connected with the direction in which it flows, two principal directions of traffic movement: parallel and perpendicular to the course of the river.

The system in which the main directions of communication intersect one another at a right angle is supplemented by the extension of external centripetal routes entering the area of the city.

In this way the supplementary transverse directions converging toward the center of the city transform the original cruciform plan of the communication system into a radial system. In such a system, however, the directions which are parallel and perpendicular to the Vistula continue to be of fundamental importance.

The system of the main tensities of traffic became the skeleton of the expansion of the city. The material substance, that is the erection of buildings, developed along these routes which gradually were transformed into city streets.

In the original stage, the buildings completely filled out the surface area contained between the arms of the radial system. The city was built up concentrically, in a compact manner.

The original center around which the city was built up was the mediaeval Old Town. As building expanded, the center

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of the system moved toward the south, parallel to the Vistula. The axis along which the movement took place was Krakowskie Przedmieście Street. As building expanded and drew away from the Vistula, new structural axes arose in the form of communication routes parallel to Krakowskie Przedmieście and taking over its role.

Marszałkowska Street took shape in the 19th century as a developmental axis and maintained its importance even in the first decades of the 20th century /48/.

In the advancing process of the development of the town, the building up of the city extended along the centripetal roads outreaching the building up of the wedges of the terrain contained between the particular roads for the purpose of urban development. Hence, the city developed according to a scheme, in which the growing central area of compact building was supplemented by developing elongated belts forming the radial system. Developing the eastern part of the city on the right side of the Vistula proceeded in a similar way but on a smaller expanse of territory.

The radial system of belts, which arose as a stage of an irregular territorial expansion of the city, was utilized for a conscious formation of its development and adopted as the foundation for developing an urbanistic plan.

One basic principle is retained in its successive versions the elaboration of which was begun in the twenties of the current century in spite of the differences issuing from adapting the plan to present conditions. The principle is the endeavor to avoid developing the city compactly on a very large expanse of surface and to find forms for its development as a loosened organism. The intention of loosening up the structure of Warsaw was the concern to obtain more propitious living conditions for the inhabitants and to avoid the necessity for using more complicated solutions for the technical equipment of the city.

The application of the principles of a loosened development of the city was counteracted by the universal although simplified views that the terrains lying in the center of the city were absolutely suitable for building purposes. Such views were justified under capitalism because of the incomes gained from the ground.

In the difficult period of the reconstruction of the city, they coincided with the effort to gain indispensable facilities

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in the actualization of investment tasks.

The urbanistic plan which today is the foundation for the development of Warsaw is in a certain sense a reasonable compromise between the principles adopted of building a city having a loosened structure and conditions and limitations defined by investment possibilities /49/.

While having a seemingly compact development of the area, the principle of a system of radial belts was maintained. It finds its expression in the penetration of green wedges into the built-up terrain.

The frame of the structure of Warsaw of today is always the traffic system in which the predominant role will be trained by the directions which are parallel and perpendicular to the Vistula. These directions have been reinforced by the construction of new arteries serving them. The new routes have been formed in the north-south direction /50/. Routes in an east-west direction have also been expanded. They will have fulfilled their tasks when more new bridges will be built across the Vistula two of which will be built in the nearest future /51/.

The system of public means of communication now consisting of tramways, trolleybuses and autobuses, will be reinforced by the construction of a Metro type line. The first such line is envisaged in the direction coinciding with the main structural axis of the city. It will run from the north to the south traversing the central districts.

The tissue formed by the buildings of the city is spread over the skeleton of the communication system.

Most of the public utilities systems are located within the central area. The buildings housing the Diet, the State Council, the Ministries and the central offices are erected here. Here also are located the schools of higher learning, scientific institutions, theaters, museums and other objects of culture and amusement. Here also are concentrated the department stores and the shops. The central area constitutes the city center proper where seats of institutions of national and metropolitan importance will continue to be erected /52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62/.

The city center is bounded on the north by the encircling

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line of the railroad, on the west the boundary runs along Żelazna Street, on the south it reaches Batory Street and on the east it is next to the Vistula. The enclave of the city center is the central area of Prague, situated between the river and Targowa Street. The surface area of the city center amounts to about 8 sq km. The city center district is also partially built up by dwelling houses.

In addition to the city center, there are also organized territorial units, predominantly dwellings in function, forming to some extent independent districts with their centers, complementing the city center in function, and with their own local service, economic and social systems.

The construction of separate districts, formed in accordance with the principles of contemporary urbanistics, is utilized not only for aggregates actualized from the ground up. Circumstances arising out of war damages are utilized to improve housing conditions in the old districts. The nineteenth century method of building cells around a small courtyard is gradually vanishing. Access is open to light and air. Verdure penetrates in between the buildings.

In the built-up dwelling sections, the multifamily 5-7 storey flat blocks predominate. High buildings of over ten storeys are also sometimes erected /63, 64, 65, 66, 67, 68/.

One family, detached houses were generally located in the periphery of the city. The predominant part of such buildings was marked by their primitive technique and high degree of wear. At present this is replaced by more intensive building. Large reserves for extensive building is envisaged outside of the boundaries of the city in the internal zone of urban agglomeration, where this type of building is predominant anyway /69, 70/.

Industry is concentrated in five large districts along the periphery of the built-up urban section. In addition to this, single plants or smaller industrial aggregates are distributed within or in close proximity to the dwelling house section.

Of the five industrial sections, some arose out of the former factory districts /Wola, Targówek/, others were newly built since 1950 /Żerań, Służewiec, Młociny/.

Those branches of the industry which were not troublesome and are characterized by a high rate of employment in relation

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to the surface area occupied expanded in Wola, the oldest district and nearest to the city center. These are the electrotechnical, machine, polygraphic etc. industries.

Heavy industrial plants, troublesome for the surroundings and needing large terrains were located in Żerań. The electric heating plant, the passenger car factory, the cement grinding station and a large industrial combine of precast building materials were built in this section.

The chief industrial object in Młociny is a large and expanding iron and steel foundry /71/.

Plants in various lines of production. machines and store-houses operate in the remaining districts. There are railway side lines with their own service stations in the industrial districts. Żerań also makes use of waterway transportation because it lies on the canal which connects the Vistula with the Bug river.

A large part of the city is heated by a central heating system supplied by the Electric Power and Heating Plants /72/.

The terrains lying in the suburban zone, surrounding the administrative area of the city are subject to urban development simultaneously with the development of Warsaw. Regional planning also encompasses the preparations made to integrate the suburban zone into Warsaw into a uniform social, economic and physical organism, within the boundaries of which the life of a great concentration in the capital would expand.

Work on regional planning was undertaken in 1930. Since that time there have been elaborated several conceptions reflecting factual views and depending on the changing circumstances.

Although features are very varied in the certain conceptions, in all is found the same immutable principle of the development of its physical structure. The principle issues from the analysis of the law governing the development of settlements up to the present, taking into account the natural geographical conditions /73, 74/.

Settlement in the suburban zone, similarly as in Warsaw, arose within the area influenced by centripetal communication, with the difference that the role of the axis along which buildings were most densely erected was assumed by the railway

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lines. The result was that the framework of the urbanized terrain outside of the city limits also formed a system of radial belts, the wedges contained between the particular belts left under the agricultural cultivation were much broader, and their width increased as the distance from the agglomeration center increased.

The intensity of the belts was not uniform. The most densely built up belt was the one running perpendicularly to the Vistula toward the west along the oldest railway line, the Vienna-Warsaw. On the other hand, settlements parallel to the Vistula, which in the structure of the city is predominant, are developed much less densely in the suburban zone and that only on the right side of the river. On the left side, the traces of urbanization are negligible in spite of the advantageous physiographic conditions. There is an absence of railway communication here which is the basic factor interacting with the urbanization of a terrain.

The plans for the development of agglomeration, maintaining the framework of the system of radial belts, suggested that they be supplemented by forming new belts densely settled especially in the direction parallel to the Vistula. In connection with this, it was envisaged to run a railway communication line along the left bank.

Assumptions were made at the same time for the maximum and optimum territorial and demographic development of Warsaw and for the size of agglomeration defined by the length and width of individual belts of settlement. Settlement units which were organized as autonomous settlements and divided one from the other by undeveloped terrains were not taken into account in the construction of the belts. The basic feature of the physical system proposed was the flexibility of its demographic contents while retaining an unchanged territorial range. Flexibility could be regulated and the capacity of the system developed by forming within the belts new settlement units or by increasing to a certain limit their size.

The conception of a functional Warsaw, elaborated by Jan Chmielewski and Szymon Syrkus, was the one that went farthest and was the most consistent although it was to a great degree theoretical. The work was presented in the year 1934 at the Congress of the CIRPAC in London where it was highly appreciated /75/.

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The importance of the basic axes of the system, the parallel and the perpendicular were very precisely underlined in the structure of a functional Warsaw. The remaining oblique directions fulfill but a very negligible complementary role in the scheme of settlement distribution. The urbanized terrains, organized as closed units, distributed in rhythmic intervals are subjected to functional differentiation into dwelling units and industrial units. Arranged according to type, the dwelling units and the industrial units constitute separate belts running parallel one to the other, each of which is equipped in corresponding transportation means. A communication system adapted to such a system is highly expanded. Denser settlement units, fulfilling the role of service centers arise at the junctures, where communication routes running in different directions intersect.

Although the principles laid down for the structure of a functional Warsaw, issuing from theoretical deliberations, had no features of a real design, the idea presented in the elaboration undoubtedly inspired the further consecutive conceptions for a regional plan.

Factual conceptions for a regional plan

The basic assumption in the current work on regional plans is the size of the agglomeration of the capital which in 2000 is to reach the number of about 4 million inhabitants.

The conception of the development of the region is being worked out simultaneously by two institutions. They are: The Town Planning Studio of Warsaw, which has extended the range of its interest to the terrains of the suburban zone and the Provincial Studio of Regional Planning. The task of the latter is to prepare a plan for the development of the entire province, together with the capital city and its suburban zone. Preparing a plan for the agglomeration of Warsaw is a subject apart, the elaboration of which fell to the Provincial Studio after it was integrated with the Warsaw Studio which had previously operated separately.

The inferences issuing from both elaborations are regarded as alternatives. After the two elaborations have been discussed and examined, these will form the foundation for a choice of one of them or an adaptation of one to the other will be worked out.

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With regard to Warsaw as an administrative unit, both alternatives retain the principle of defining limits for its development which cannot be overstepped.

The urbanistic plans for Warsaw legitimately and effectively assume that with a maximum growth, the city will attain the number of about 1.700 thousand inhabitants. At a later period when material conditions will improve to allow for a higher norm of dwelling surface area, the number of inhabitants should fall to about 1.400 thousands.

The studies made indicated that to reach population capacity corresponding to needs will require a fundamental supplement of the present structure of settlements.

In posing the conceptions of a future agglomeration structure, both alternative elaborations retained the features of a loosened system which would be so formed that it would constitute a uniform physical and economic organism and that its inhabitants would have the feeling of belonging to one social group. In order to fulfill these conditions, there should be an endeavor made to distribute the maximum number of the population over an area limited to such an extent that it would permit maintaining the dwelling conditions desired.

In integrating the settlement of terrains both alternatives take into account the traditional line, according to the present conceptions, of expanding the areas lying along the Vistula valley on the sector from the mouth of the Narew river on the north to the intersection of the river with the transit railway line.

Such a filled-out terrain does not suffice, however, to accommodate the number of 4 million inhabitants assumed. The manner in which these settlement terrains are to be integrated constitutes the essential difference between both alternatives.

The conception elaborated by the Town Planning Studio of Warsaw consists in introducing into the radial belt system several further directions for settling, which would develop along new centripetal lines which would supplement the present railway communication system. In an expanded radial system, the existing centers would be subjected to a reorganization which would make it possible to gain the indispensable capacity by a more intense development of building /76/.

The alternative conception elaborated by the Studio of

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Regional Planning of Warsaw before it was joined to the Provincial Studio does not introduce any additional settlement belts. The physical structure according to the solution of the Warsaw Studio, called the filial system in the working plans, assumes that an integrated system of three cities be formed in the N-S directions parallel to the Vistula. In this system, next to Warsaw, important roles will be played by the centers located in the region of Góra Kalwaria and Nowy Dwór - Modlin. The initial assumption is that the population of Góra Kalwaria would amount to about 500 thousand inhabitants, and the Nowy Dwór - Modlin complex about 400 thousand. The development of the settlements existing along the present communication lines would be moderate and would take place as a continuation of the tendencies so far, which depend on their present state of development /77/.

The filial agglomeration system will require that means of communication, connecting Warsaw with Góra Kalwaria and the Nowy Dwór - Modlin complex, be intensely developed. Such would be the only fundamental complement of the present transportation system. The distribution of large concentrations of the population within the range of such an expanded transportation system would ensure conditions for a full economic utilization of the transportation capacity of the new lines.

Stress must be laid on the fact that including the new routes into the Warsaw junction system would be an organic extension of the principal directions of the present system and would present no great difficulties. Locating settlement units, concentrating the greatest masses of the population agglomeration on terrains near the Vistula and partly near the Narew river would facilitate the solution of water supply and sewage.

Having two new agglomeration centers of a metropolitan character it will be possible and to the purpose to create conditions for communal life and conditions for a technical organization on a level existing at present in Warsaw. Thus real possibilities will arise for the decentralization of production plants and institutions of the capital which will safeguard the central agglomeration zone - the city of Warsaw against a violent endeavor to supplement its functions and

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against a tendency to an unlimited population and physical growth.

The new cities of the branch system are thought out as organisms of an equilibrated number of places of employment and dwelling places and equipped in a full set of service contrivances.

According to both alternatives, the development of the terrains lying between the arms of the urbanized belts was subordinated to the function of settlement. Recreation centers will be organized on these terrains and farming will be adapted to the supply of the agglomeration by expanding the production of vegetables and fruit and breeding.

Such utilization of the terrains conforms to the present manner of their utilization.

In the immediate proximity of Warsaw, there are intensive forms of farming directed to the production of vegetables and fruit. Such farming is based on the experience of many years of the farmers who use in an increasing degree the most modern methods of cultivation, especially under glass. Of all the large cities, Warsaw is in an exceptionally fortunate position since it is able to obtain supplies of products from its closest surroundings for consumption in a fresh state.

The environments of Warsaw are intensely utilized by the inhabitants of Warsaw as a place of recreation. The recreation centers are situated either in places for their beauty in natural landscape or for their proximity to objects of historical value.

A place of recreation which is interesting and popular is the center in Zalesie Górne /about 10 km distant from the city/. Its chief attraction is an artificial lake arranged as a swimming pool, situated in picturesque surroundings in the woods/78/.

Objects of interest to the tourist and as a recreation center are historical monuments. Of such which many like to visit is the park of Wilanów with a palace erected in the 17th century by King John III Sobieski /79/.

Żelazowa Wola, the birthplace of Fryderyk Chopin, lies 50 km distant from Warsaw in the lovely Utrata valley. A small manor house, carefully restored as a museum containing souvenirs after the great composer and the garden surrounding it

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with a concert stage in the open air is a favourite place visited by the inhabitants of the capital.

The assumptions of the regional plan envisage further recreation centers. From among such, mention should be made of a series of recreation centers which will make up the General Pulaski tourist route.

Winiary, the birthplace of Kazimierz Pulaski, a Polish and American hero, lies on the high banks of the river Pilica on the southern end of the region. The lovely park picturesquely situated on the edge of a picturesque river bank and reconstructed after being damaged during the war is to be the end point of the Kazimierz Pulaski tourist route. The tourist route is to run south from Warsaw along the valleys of the Vistula and the Pilica rivers. A regional museum is to be founded in Winiary dedicated to the memory of Pulaski. In the vicinity of Winiary water sport and camping centers are to be organized /81, 82/.

Further recreation centers are planned in connection with flood waters on the Vistula and the Narew which will be formed when the elevating steps will be constructed. A floodwater bay will be formed on the Vistula to the north of Warsaw, in its immediate vicinity. It will have a surface area of 40 sq km. Such a floodwater bay of a surface area of 10 sq km is already actualized on the Narew river and the arrangement of its shores already begun. In addition to this the Kampinos Forest will be a valued recreation center after it has been properly developed /83/.